BIOGRAPHY

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PRIESTLEY'S LIFE IN NORTHUMBERLAND AND DISCUSSION OF THE PRIESTLEY RELICS ON EXHIBITION IN THE MUSEUM*

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Seven years ago, on the fourteenth of November, while I was working in my laboratory on the East River water front of New York City, I was delighted to receive a visit from my old friend Professor George Gilbert Pond, at that time the Acting President of the Pennsylvania State College. Little did I realize that this was to be the last meeting in the twenty-eight years of our acquaintance. In the course of our conversation on that pleasant autumn day Professor Pond remarked to me very casually that he had recently purchased at an auction sale the home of Joseph Priestley. This piece of intelligence not only thrilled but greatly interested me. In former days, while traveling to or from State College, I frequently stopped at Northumberland to visit the old residence where Priestley worked and died. It had always appealed to me as a precious inheritance which deserved to be set apart and preserved as a permanent memorial. Professor Pond's intention to insure the preservation of Joseph Priestley's home against possible misuse or destruction was, therefore, hailed by me with delight. The credit of insuring the future preservation of Joseph Priestley's last home as a Mecca for future generations of American chemists belongs entirely to him and the loyal alumni of Pennsylvania State College are to be congratulated upon their share in making possible the realization of this project.

After an interval of over one hundred and twenty-two years since the death of Joseph Priestley we have gathered here today to participate in the dedication of his home as a permanent memorial, and the question might well be asked, "What is there about the life and last residence of this simple unassuming clergyman which entitles them to such distinction?" There are many reasons for this and they have been so well summarized by that eminent English critic, historian, and jurist, Frederic Harrison, that I will quote his words:

> If we choose one man as a type of the intellectual energy of the eighteenth century we could hardly find a better than Joseph Priestley, though his was not the greatest mind of the century. His versatility, eagerness, activity and humanity; the immense range of his curiosity in all things, physical, moral or social; his place in science, in theology, in philosophy and in politics; his peculiar relation to the Revolution, and the pathetic story of his unmerited sufferings, may make him the hero of the eighteenth century.

If anyone should doubt the accuracy of Mr. Harrison's estimate let him go to some large library and note the stupendous number of biblio-

* Read at the meeting on the lawn of Joseph Priestley's house, Northumberland, Pa., September 5, 1926, as a part of the exercises connected with the pilgrimage made by chemists during the golden jubilee of the American Chemical Society.

graphic references to books, tracts, and articles about Priestley. If curiosity should prompt the inquirer to investigate further he would find that Priestley had made his influence felt not only in the fields of theology and science, but also in those of politics, industry, philanthropy, sociology, philosophy, history, and education. The hold which he acquired upon the thoughts of men during his residence in England and America was tremendous and his influence is destined to remain as long as the English language is spoken. Priestley is one of those common possessions which, belonging to England and America alike, tend toward promoting a unity of thought and understanding. Rumford, the founder of the Royal Institution and of the Rumford Professorship at Harvard, is another such common possession. Unjust suspicions and threats of violence obliged Rumford to find protection in England; religious and political persecutions forced Priestley to become an exile to America. Although forcibly accomplished, it was our first international exchange of scientists.

It was on June 4, 1794, that Doctor and Mrs. Priestley, after a long two months' voyage from England, arrived in America. Following a series of hearty receptions in New York and Philadelphia they proceeded to the home of their son in Northumberland, which was then a frontier settlement almost in the heart of a wilderness. The first thought of the distinguished exile was the erection of a house and laboratory where he could continue the work which had been so harshly interrupted by the destruction of his home in England during the riots of Birmingham. Doctor Walker has told you the story of the erection of the present house and it now devolves upon me to describe briefly some of the accomplishments of Priestley during his residence in Northumberland from the time of his arrival here until his death in February, 1804. Never were his intellectual vigor, industry, and astonishing versatility better displayed than during these last years.

In evaluating the scientific and literary accomplishments of Priestley during this closing period of his life we must take into account the great difficulties and limitations under which he worked. Northumberland, at the time of his arrival here, was almost in the heart of a wilderness. A stage made the journey to Philadelphia only once in six weeks and the difficulties of communication, whether by land or water, were almost insuperable at certain seasons of the year. Those of us who made the journey today from Philadelphia to Northumberland can only faintly realize the troubles which Priestley encountered in transporting his library and laboratory equipment to this junction of the branches of the Susquehanna.

Literary and scientific friends, who were such an inspiration to Priestley in England, were wholly absent here and this lack of stimulating companionship was a serious loss. But, deprived as he was of these and

other cultural advantages, he took a most complacent view of his altered situation and with fine philosophy speedily adapted himself to life in the "back woods." By establishing one of the best equipped libraries and laboratories of his time in Northumberland, Joseph Priestley advanced the intellectual frontier of the United States many miles to the westward.

The first piece of scientific work which Priestley performed in Northumberland was one that might naturally be expected of so eminent a representative of the pneumatic school of chemistry. On May 22, 1795, he wrote to his friend Dr. Rush, "the day after I received your favour I, having just then got my apparatus ready, made trial of the air of Northumberland by the test of nitrous air, but found it not sensibly different from that of England." This is one of the earliest recorded attempts to analyze the air of the Western Hemisphere.

The chemical discovery of greatest importance which Joseph Priestley made in his Northumberland laboratory was that of carbon monoxide, which he obtained in 1799 by passing steam over heated charcoal and also by heating "finery cinder and charcoal." It was the last of the long series of gases that Priestley discovered. Oxygen, ammonia, hydrogen chloride, hydrogen sulfide, nitric oxide, nitrous oxide, sulfur dioxide, and carbon monoxide—to name them all—and it is a list which places Priestley's name for all time among the front rank of chemists. One has only to think of what these gases mean to modern industry and civilization. It was with reference to Priestley's discovery of carbon monoxide in Northumberland that Sir Thomas E. Thorpe, the eminent English chemist and biographer of Priestley, once wrote so charmingly:

> If, too, as you draw up to the fire betwixt the gloaming and the mirk of these dull, cold, November days, and note the little blue flame playing around the red-hot coals, think kindly of Priestley, for he first told us of the nature of that flame when in the exile to which our forefathers drove him.

Interesting observations upon spontaneous combustion, the diffusion of gases, the liberation of air from water, the solution of glass by caustic alkalies, and other chemical phenomena too numerous to mention were also made by Priestley in the seclusion of his Northumberland laboratory. These miscellaneous chemical activities were regarded, however, by the good Doctor as mere chips of his Northumberland workshop when compared with the great dominating purpose, so frequently expressed in his correspondence, "of overturning the French new theory of chemistry" proposed by Lavoisier. It was for the confirmation and final vindication of his favorite doctrine of phlogiston that he chiefly labored and so "in 1800," to quote from his biographer, Doctor Thorpe, "he put together his last scientific work, and the one which he regarded as the crown of all his efforts, viz., his 'Doctrine of Phlogiston Established.'" This final chal-

lenge of the last champion of phlogiston against the swelling army of the new chemical school is a most interesting work and one greatly prized by the collectors of rare scientific books. On turning its pages we are transported back over two centuries to the time when Stahl first explained chemical phenomena by proposing the existence of a hypothetical fire-substance which he termed "phlogiston." His doctrine, although incorrect, served a most useful purpose, for out of the battles which were fought for its overthrow and defence was secured the experimental evidence that became the foundation of modern chemistry. It is worth knowing that the last shot in this historic conflict was fired by Doctor Priestley from the stronghold of his Northumberland laboratory.

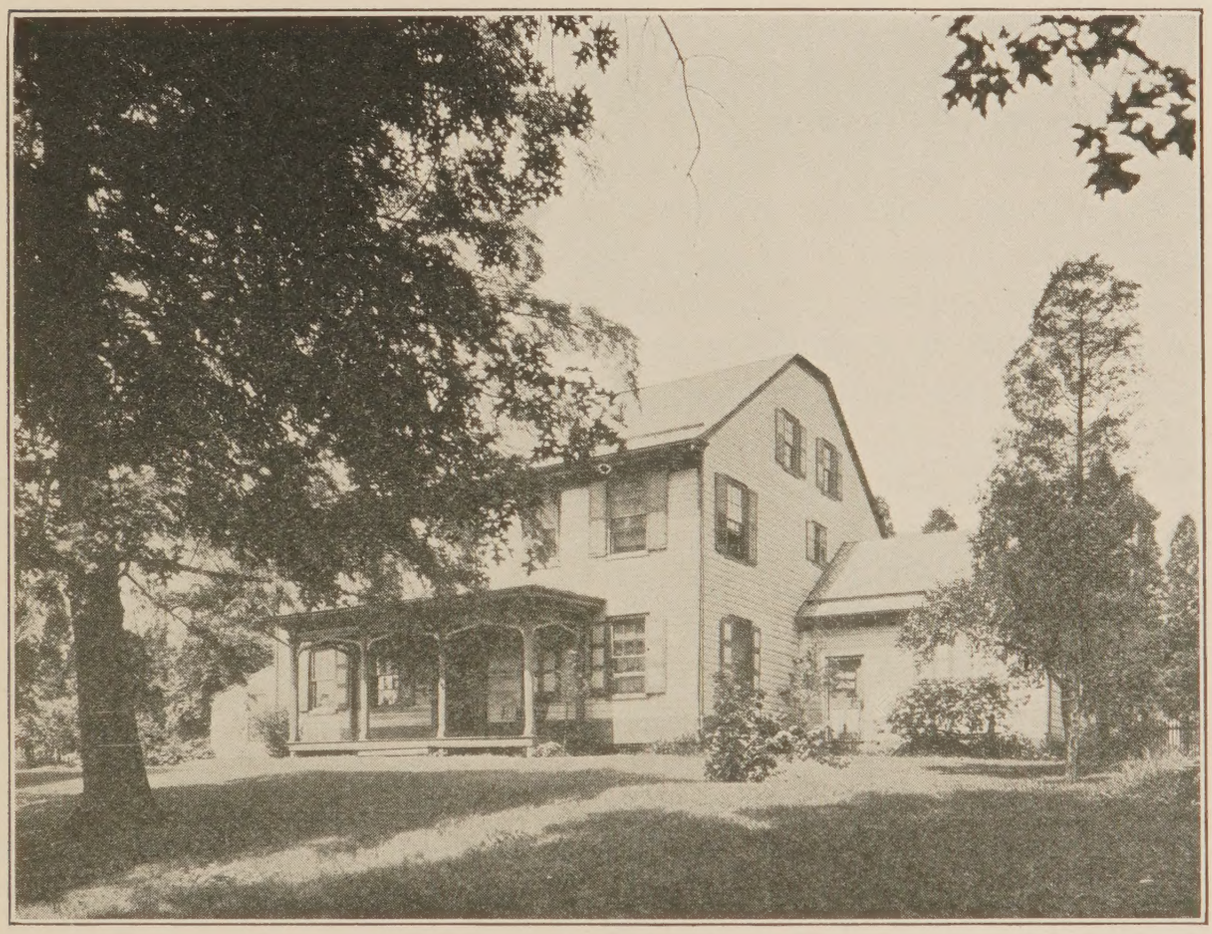
Priestley, in one of his intimate letters, expresses a sincere belief in the final triumph of his doctrine of phlogiston.

> The annual expense of my laboratory (he writes) will hardly exceed 50 pounds, and I think I may have done more in proportion to my expenses than any other man. What I have done here, and with little expense, will in time be thought very considerable; but on account of the almost universal reception of the new theory, what I do is not, at present, attended to; but Mr. Watt and Mr. Kier, as good chemists as any in Europe, approve of my tract on *Phlogiston*, and truth will in time prevail over any error.

The defenders of phlogiston, as we review their writings, seem to have viewed everything reversed. To them the ponderable was imponderable, combination was decomposition, elementary substances were compounds, and compounds were elementary. Conclusions exactly opposite to those which they deduced can be drawn from all their arguments, and so Priestley's own experiments became the best weapons of his opponents. But such use of his discoveries aroused no anger on the good Doctor's part. He paid smiling attention to the arguments of the other side and simply said: "It is not my opinions on which I lay stress. Let the new facts, from which I deduce them, be considered my discoveries and let other persons draw better inferences if they can." This simple, truth-loving attitude made him the perfect expression of amiability, and so it happened that those who differed most from his opinions were often his strongest friends.

Priestley lived altogether only a little over six years in the house which he built in Northumberland, but in this small period he made a record of accomplishment such as few men can show in an entire lifetime. There were many other activities besides those of chemistry which engaged his attention. It was in this house that he completed his "General History of the Christian Church," his "Notes on the Scriptures," his "Comparison of the Institutions of Moses with Those of the Hindoos," his much discussed "Letters to the Inhabitants of Northumberland," and his little pamphlet "Socrates and Jesus Compared." It was here that he conducted a most interesting and intimate correspondence with old friends

in England and with Thomas Jefferson, Benjamin Rush, Samuel L. Mitchill, and other prominent men in America. It was here that he lectured to a class of young students upon theology and philosophy, that he considered methods of education and evolved plans, unfortunately never realized, for founding a college in Northumberland. It was here that he devoted several hours of each day to readings in Hebrew, Greek, Latin, and modern languages. It was from this house that he made his occasional visits to Philadelphia where he attended the meetings of the American Philosophical Society and enjoyed the social life of the metropo-



PRIESTLEY HOUSE FROM THE SOUTHEAST
(Showing Priestley's Laboratory in the "L.")

lis. And, finally, it was to this house that he returned broken in health, yet still filled with an unquenchable desire to labor and serve. His career was an active one, rich in contacts, friendships, and accomplishments, so that he could truly say to his good friend Doctor Rush: "I have abundant reason to be satisfied and shall retire from life *conviva satur.*"

Only a few days before the end he struggled to his laboratory and lit his fire, eager to make some new experiment, but the effort was too much for his feeble strength and he was obliged to return for rest to his study. His final hours were spent in dictating corrections in his proofs. When

these were read to him he replied, "That is right; I have now done," and with these last words one of the world's greatest truth-seekers passed quietly away.

It was only last Tuesday that I visited in Virginia the residence and last resting place of Thomas Jefferson, the author of the Declaration of Independence of which we are now celebrating the one hundred and fiftieth anniversary. As I looked down from Jefferson's mountain home upon the University which he founded and over the beautiful valley of the Blue Ridge, I thought of the close friendship which existed between our third President and Joseph Priestley. It was in this beautiful valley that Jefferson invited Priestley to make his home and it was in the University which he was proposing to establish that he thought of offering Priestley a professorship. The aged exile of Northumberland was, however, too far advanced in life to consider such an undertaking. "Were I a few years younger," he wrote to Jefferson, "and more movable, I should make interest for some appointment in your institution myself; but age and inactivity are fast approaching, and I am so fixed here that a remove is absolutely impossible unless you were possessed of *Aladdin's lamp*, and could transport my house, library and laboratory, into Virginia without trouble or expense."

But while Priestley was unable to move to Virginia he assisted Jefferson in no small degree by the suggestions which he made regarding methods of instruction. In reading the "Hints Concerning Public Education" which Priestley prepared for Jefferson, we are not only surprised at the extreme modernism of his educational opinions but we are led to wonder how many of Priestley's ideas were incorporated by Jefferson in the project of his new university. Jefferson and Priestley resembled each other so greatly in intellectual tastes and in the liberal views which they held with regard to politics, philosophy, and religion that their friendship was a natural consequence of the strong admiration which each of these men conceived for the other.

* * * *

Through the enterprise and liberality of the members of the G. G. Pond Memorial Association the preservation of the house and laboratory which Joseph Priestley erected has not only been assured, but there has been constructed here a beautiful fireproof museum for containing certain relics of the famous discoverer of oxygen. The success of this project has been made certain by the willingness of some of the descendants of Doctor Priestley and of various others who possessed objects that are associated with his memory to deposit their treasures in this museum for the benefit and pleasure of future generations. The extensive collection of memorabilia which are exhibited here today, consisting of apparatus, letters, manuscripts, books, book plates, prints, portraits, personal

effects, and other objects—hastily assembled and too numerous to describe individually—must not be regarded, however, as the final aggregate of what this museum may be expected to contain. I know from my own limited experience as a collector the abundance of letters, documents, pamphlets, books, prints, and other material pertaining to Priestley which can still be acquired in England, America, and other parts of the world. The directors of this museum and the many admirers of Priestley in the United States will no doubt be constantly in search of new acquisitions to enhance the value of the present collection.

Joseph Priestley Museum from the Southwest

From the memorabilia which are deposited here the visitor will be able to form a vivid conception of the personality and versatile genius of Joseph Priestley. He will be able to reconstruct the numerous contacts and activities of his busy life just as the visitor at Mt. Vernon is enabled, from its buildings, gardens, and collections, to form a conception of the interests and pursuits of Washington. No object, however small or trivial, should be ignored, for if it has some bearing upon the life or work or diversions of Priestley it will speak eloquently of the man. Here should

be gathered as much as possible of his original apparatus, of his original furniture and of the original books, which, to the number of four thousand, filled the shelves of his library. Here should be deposited as many as possible of the documents, papers, and letters that were written by his hand. The student of Priestley's life should find here every edition of his numerous books; all the various published references to him or to his works; all the biographies and accounts of his life which have been printed; and originals or copies of all the prints, cartoons, portraits, and medallions that bear his likeness. The late Henry Carrington Bolton, the well-known historian and bibliographer of chemistry, described no less than eighty-four different likenesses of Priestley—painted, engraved, lithographed, stamped, moulded, cast, and carved—and there are many others unknown to Doctor Bolton, which might be added to his list. There are shown here at Northumberland today many different portraits of Priestley, which I hope all of you will examine after the close of the present meeting.

Among other museum objects to which I invite your attention are bell jars, tubes, glassware, and other small pieces of Priestley's chemical apparatus; a surveying instrument; his microscope with sections and other accessories; several telescopes with their attachments; and a magic lantern with various slides which Priestley is said to have used for entertaining his children and grand-children. Priestley was very fond of optical experiments and there is a well-founded tradition that the original west shutter of the south-west window on the second floor of this dwelling contained in the upper part a small hole, bored there by Priestley for the purpose of admitting into the darkened room a narrow beam of sunlight which he resolved with a prism into the various colors of the spectrum. This shutter was unfortunately taken away years ago by a curio hunter and no trace of it remains.

Among some of the more personal objects which are exhibited here today are Dr. Priestley's snuff box, glasses, and chess board. Upon the back of the latter he once wrote his name which, although faintly legible, can still be read.

Among the numerous manuscripts, documents, and other papers in Priestley's handwriting deposited in this museum there is an autograph letter which I would particularly ask you to examine. It was written by Priestley at Reading on April 17, 1801, as he was traveling home with his daughter from Philadelphia, where he had just suffered from a serious illness. In conveying to his friend John Vaughan the impressions of this journey he writes:

> Along the whole road I am struck with the marks of an astonishing degree of improvement since I came this way four years ago. I do not think that any part of England is better cultivated, and at present the wheat is in a very promising state. I wish

we may hear of that of England promising as well. Three years of such a scarcity is more than any country could bear and you will believe me when I say that, if it was in my power, I would guard it not only from famine, but from every other calamity.

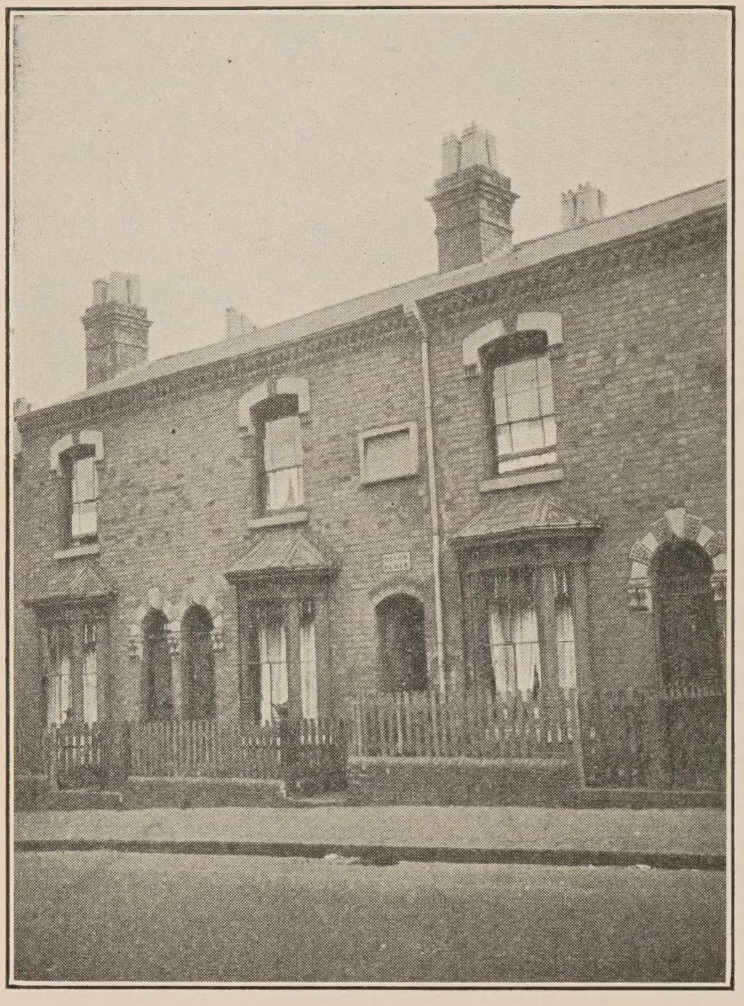
Glance at this letter, for its faded pages will bring to you most vividly the deep love which Priestley always bore to England in the days of his exile, notwithstanding the unmerited hostility and sufferings which he endured at the hands of his former countrymen.

THE DESTRUCTION OF PRIESTLEY'S ENGLISH HOME
An engraving after a sketch made on the spot. Photographic reproduction loaned by Dr. Elwood Hendrick.

While the mementos of Priestley's Northumberland career form very properly the most conspicuous part of the objects which are deposited here, the souvenirs of his previous life in England should not be overlooked. Objects relating to the Birmingham riots, which were the cause of his coming to America, are also exhibited here today. Among them is a copy of the *Gentleman's Magazine* for July, 1791, which contains a contemporaneous account of this destructive uprising, a copy of Priestley's letter to the Inhabitants of the Town of Birmingham upon the loss of his house, apparatus, and library, and a copy of a very unfriendly anonymous reply which this letter evoked. Here also is one of the mutilated chemical

books, with Priestley's famous book plate, which survived the depredations of the mob that burned his house and pillaged his library.

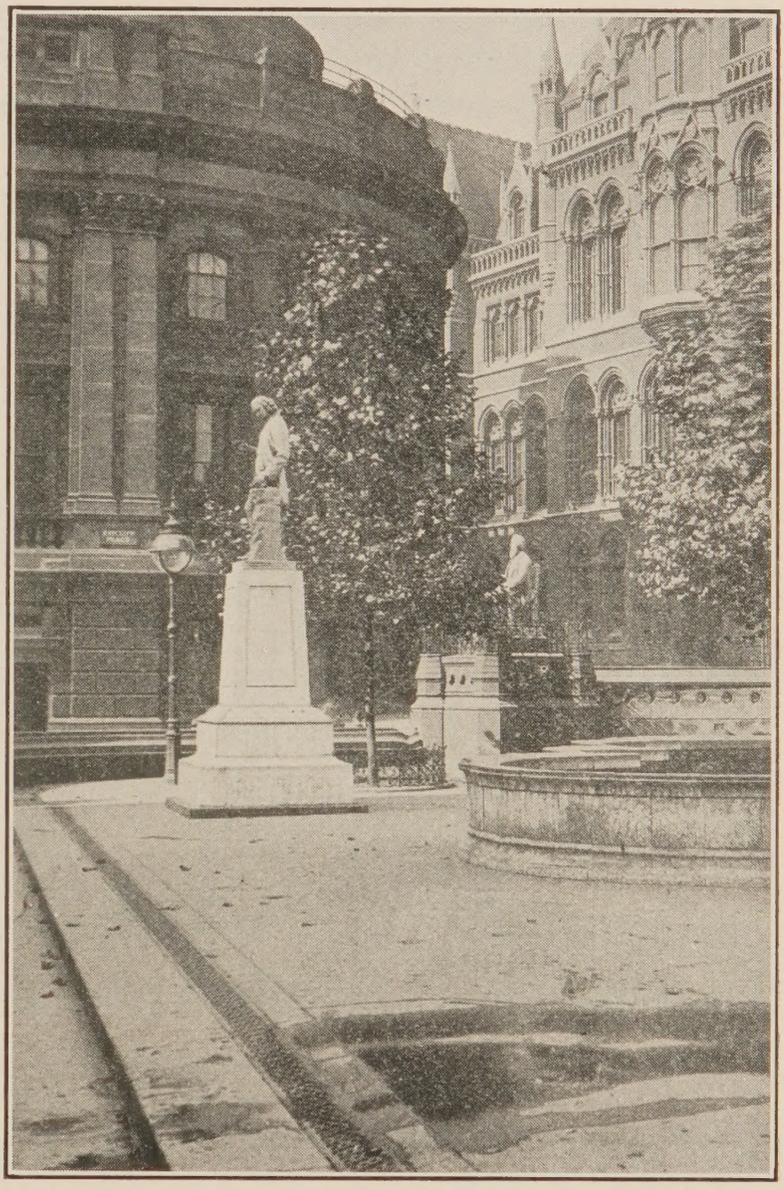
Objects connected with Priestley's acquaintance in England with Benjamin Franklin also find here a very appropriate resting place. The warmest friendship existed between Franklin and Priestley, who resembled each other so closely in their love for science, in their spirit of liberalism, in their political opinions, and in their versatility. "There can be no question," wrote Doctor Thorpe in his "Life of Priestley," "that the friendship (of Franklin) reacted powerfully on Priestley's work as a political thinker and as a natural philosopher. Indeed, it may be truthfully said that Franklin made Priestley into a man of science." As an evidence of this influence there is shown among the objects exhibited here today a copy of Priestley's first scientific book, "The History and Present State of Electricity," which was written with the encouragement of Franklin. As another example of this friendly support there is shown among the exhibits a copy of Priestley's "History of Discoveries Relating to Vision, Light and Colours," in which Franklin has set down his name as a subscriber to the generous extent of twenty copies. Among other evidences of Franklin's friendship to Priestley there are exhibited in the museum a Wedgewood pottery medallion of Franklin and his terra cotta bust by Nini which were once presented to Priestley by the great patriot and philosopher himself. The lives of Franklin, Jefferson, and Priestley are so interwoven by friendly influences and personal contacts that this memorial in Northumberland should be a Mecca not only for chemists but for every loyal American.



SITE OF THE PRIESTLEY HOUSE, BIRMINGHAM ENGLAND

This is now a part of Birmingham; in Priestley's day it was out in the country. Photograph, 1925, by Dr. J. Newton Friend.

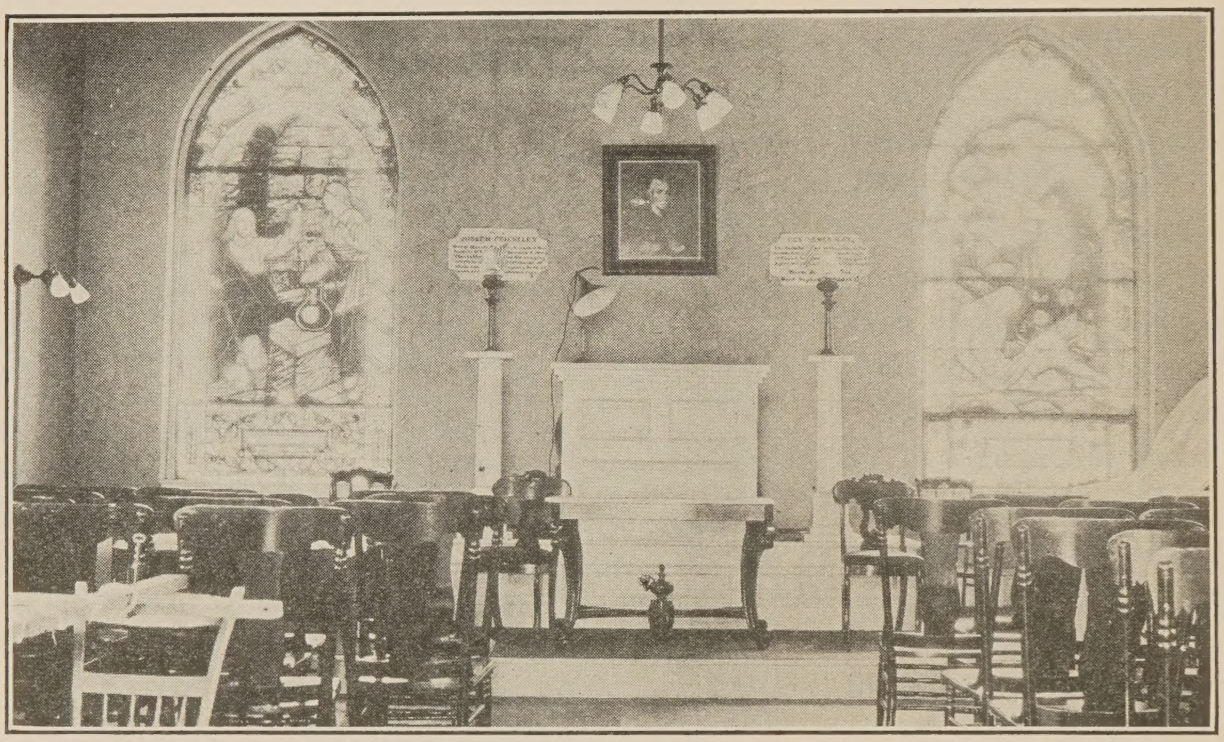
As might be expected with a person of Priestley's prominence, there are other exhibits of his relics besides the one which is now established in Northumberland. At Burlington House, London, there is a valuable collection of portraits, letters, engravings, and other memorabilia, which was bequeathed to the Royal Society by one of its deceased members, Mr. James Yates. Another collection, assembled by Samuel Timmins, is preserved in the Reference Library of Birmingham, England, where Priestley lived from 1780 until 1791. There are also deposited at Dickinson College, Pennsylvania, and at the Smithsonian Institution in Washington various pieces of chemical, electrical, and optical apparatus with which Priestley worked in his Northumberland home. President J. H. Morgan and Professor Eddy of Dickinson College have very kindly brought over from Carlisle for your inspection today Priestley's large compound burning glass, his airgun and compressor, two large mounted telescopes, and various pieces of glass apparatus. The various objects exhibited in the museum will enable you to form an idea of the extensive range of Priestley's scientific interests. It is planned eventually to install in the wing of this residence (nearest to the museum) a replica of the original laboratory where Priestley worked—a laboratory which in its day was the most extensive and complete in the western world.



THE PRIESTLEY STATUE, BIRMINGHAM, ENGLAND
The curving wall of Birmingham Public Library appears in the background. Photograph by Dr. J. Newton Friend.

In the Timmins collection of Priestley relics in Birmingham there are also preserved mementos of the celebration in 1874, when a statue was erected to Priestley in commemoration of the hundredth anniversary of the discovery of oxygen. A small replica of this statue, presented to the museum by Professor Edgar F. Smith of the University of Pennsylvania, can be seen among the objects exhibited in the Museum.

Simultaneous with the celebration at Priestley's English home there was held a Centennial Anniversary at his American home and an exchange of cablegrams between Birmingham and Northumberland was a pleasant feature of that double celebration. Just as mementos of the English anniversary are preserved in Birmingham, souvenirs of the American meeting, consisting of photographs of the attending chemists and other



INTERIOR OF JOSEPH PRIESTLEY MEMORIAL CHURCH, NORTHUMBERLAND, PA.
Photograph, 1921, by Dr. Louise McDanell Browne.

memorabilia, are deposited here in Northumberland. Following the establishment of this memorial and the constant enrichment of its collections, this spot will long continue to be a meeting place for future gatherings and the records of all such celebrations should be carefully preserved in this home of Joseph Priestley.

The services which Priestley accomplished for the advancement of science, for the improvement of humanity, and for the promotion of religious toleration were so far-reaching in their effects that the testimonials established in his honor are among the most precious heritages of our modern civilization. The memorial which is dedicated here in Northumberland today is unique among all others in being established in the very home which Priestley built and where he worked and died. From the

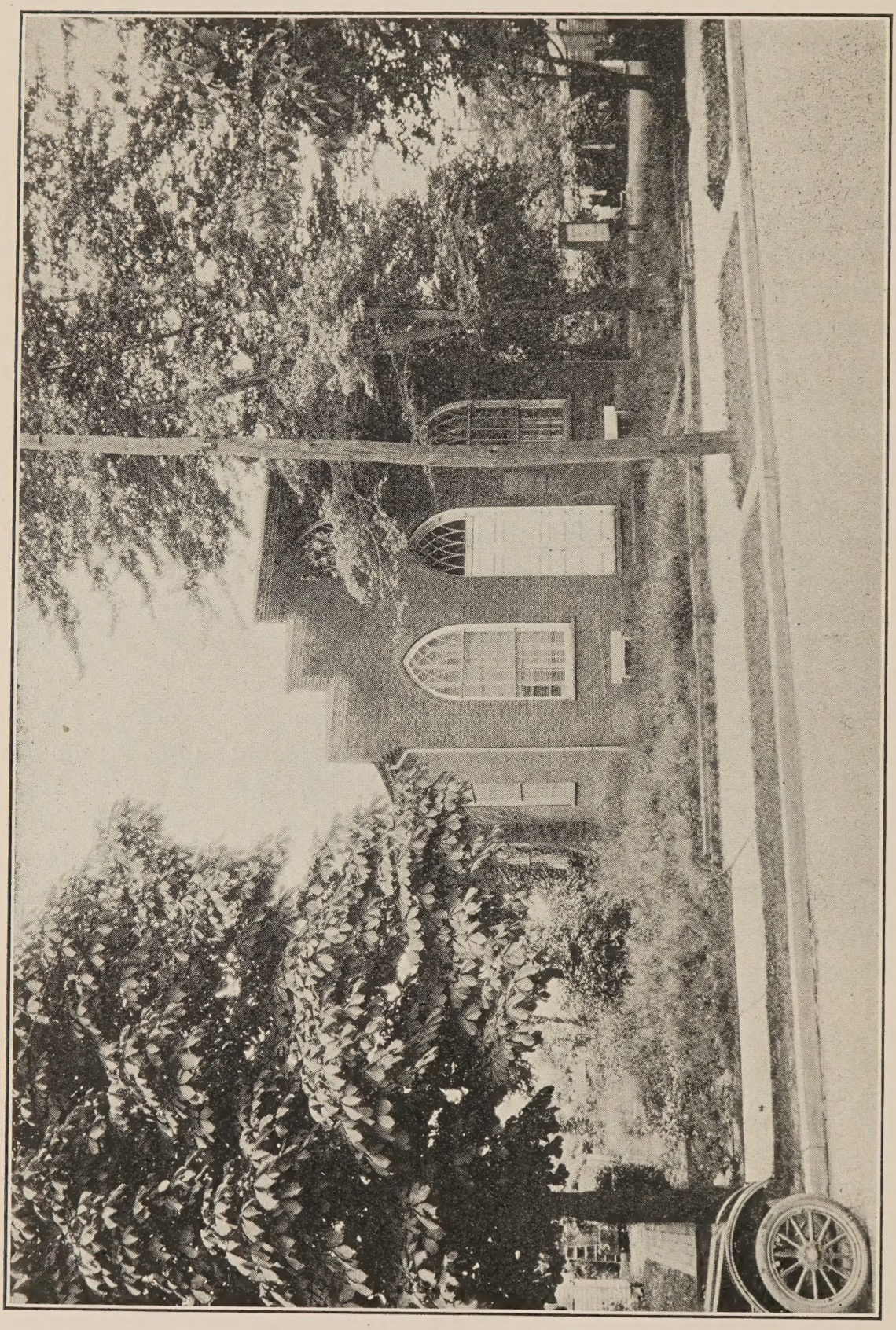
doorway of his house the visitor can enjoy the same distant outlook which caused the aged exile upon his arrival here to remark that nothing can be more delightful. It was on this spot that he cultivated the little garden which was so great a pleasure in his later years. Here also in full view of the river and hills which once delighted his eye is the very grave of Priestley himself.

It is almost exactly five years ago when making my last visit to this town that I called upon Miss Annie Priestley, a great-great-granddaughter of Joseph Priestley, and the last one of his name to live in Northumberland. She welcomed me most graciously and in the course of our conversation remarked that the conversion of this old homestead into a permanent memorial would be the fulfillment of a long-cherished desire. She showed me many souvenirs of Doctor Priestley and finally conducted me to the little chapel of the Unitarian Society, which Priestley founded in Northumberland, where certain matters awaited her attention. Her kindness, amiability, culture, benevolence, zeal for the truth, and leader ship in work for human welfare are pleasant to recall and those who knew her are prompted to reflect that these were the same inherited traits which made her distinguished ancestor so greatly loved. It is a satisfaction to know that her wishes regarding the preservation of the old Priestley homestead have now been realized, although we regret that she herself was called away before the present dedication.

The purpose of this memorial is not to glorify the accomplishments of Priestley, but to perpetuate a knowledge of his life and character. His career is a refutation of the false idea, so commonly expressed, that the pursuit of science is destructive of religion. Love for science and devotion to religion were so combined in him that his scientific writings are permeated with a spirit of lofty reverence. I can close my remarks in no better way than by quoting his words upon the moral benefits which are derived from the pursuit of science:

> The Philosopher (he says) ought to be something greater, and better than another man. The contemplation of the works of God should give a sublimity to his virtue, should expand his benevolence, extinguish everything mean, base and selfish in his nature, give a dignity to all his sentiments, and teach him to aspire to the moral perfections of the Great Author of all things. What great and exalted beings would philosophers be, would they but let the objects about which they are conversant have their proper moral effect upon their minds. A life spent in the contemplation of the productions of divine power, wisdom and goodness, would be a life of devotion. The more we see of the wonderful structure of the world, and of the laws of nature, the more clearly do we comprehend their admirable uses to make all the percipient creation happy; a sentiment which cannot but fill the heart with unbounded love, gratitude and joy.

Joseph Priestley's own life was a shining example of the ideal which he has so eloquently described.



UNITARIAN CHURCH AT NORTHUMBERLAND
Congregation founded by Priestley in 1796. This building erected in 1834.